

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) ELECTRIC LAMP

(71) We, PATENT-TREUHAND-GESELLSCHAFT FÜR ELEKTRISCHE GLÜHLAMPEN M.B.H., of 1 Hellabrunner Strasse, 8 München 90, West Germany, a German Body Corporate, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 The invention relates to an electric lamp having an external pinch constructed in the form of a base particularly a special purpose, decorative lamp or an incandescent lamp for use in motor vehicles.

15 According to the invention, there is provided an electric lamp comprising a glass bulb, a flattened glass pinch sealed to the glass bulb, lead wires brought through the pinch, looped, and returned into the pinch the looped portions of the lead wires being bent towards the pinch and an elongate groove in each face of the two narrow sides of the pinch.

25 Preferably the pinch is constructed in the form of a lamp base and comprises a substantially flat central portion bounded by enlarged end portions. By the term "lamp axis" throughout this specification and claims is meant the line passing, through the centre point of the bulb and the centre point of the exhaust tube.

30 The two faces of the webs forming the narrow sides of the pinch are preferably provided with transverse grooves which are continuous and so produce notches in the webs at the broad sides of the pinch.

35 The grooves are preferably provided in the region of the junction between the pinch and the bulb and the current supply leads which are bent over against the opposite faces of the pinch end before the grooves.

This lamp is inserted in the socket and resilient members engage in the grooves and hold the lamp. In order to remove the lamp from the socket, a force must act in the direction, of the lamp axis. There are cases, for example, in more vehicles, where a force in the axial direction is also exerted on the lamp during operation and the possibility of the lamp falling out accidentally is therefore not excluded.

In a further development of the invention, the glass base is modified in such a manner that the lamp is prevented from falling out under the action of axial forces. For this purpose, the grooves extend obliquely in relation to the lamp axis.

The grooves may extend continuously inside the web but preferably end before reaching the other edge of the narrow side of the pinch. In this case, the grooves start from one edge of the narrow side of the pinch and extend obliquely towards the free end facing away from the lamp, that is to say towards the end face of the pinch. The two grooves originate from opposite narrow sides so that the directions in which they extend cross one another.

This lamp is inserted in the socket counter to resilient forces acting in the direction of the lamp axis and then turned about the lamp axis, so that rigid holding members engage in the oblique grooves and lock the lamp on further turning. Thus the principle of the bayonet base is realised in a glass-base lamp by means of the invention.

In order to facilitate introduction of the lamp into the holder in the correct axial position, the broad sides of the pinch are equipped with guide members which extend in the axial direction and which co-operate

with corresponding guide members in the holder.

A groove which extends from the end face of the pinch towards the bulbs and which receives the current supply contacts may be provided at each of the broad sides of the pinch and extend obliquely into the pinch from the end face so that these two grooves have their minimum depth at their beginning at the end face of the pinch and their maximum depth at their end nearest to the bulb. By these means, the current supply contacts are bent from the end face to one broad side of the pinch through an angle which is greater than 90° . As a result, better fixing of the portions of the current supply contacts taken along the end face of the pinch is achieved. Although this means is particularly useful in the lamps having oblique grooves in the lateral webs, nevertheless according to the invention the invention can also be used to advantage in other lamps.

As further individual or additional means which can likewise be used, according to the invention, in other glass-base lamps, the glass material of the pinch is distributed unequally with respect to the plane of symmetry containing the sealed-in current supply leads in such a manner that it is greatest at the site of the particular current supply lead at the side round which this current supply lead is bent for example in the form of a loop. Thus an increase is achieved in the length of the part of the current supply lead taken along the end face of the pinch and serving as a base contact.

The invention will now be explained further with reference to some examples in the Figures.

Figure 1 shows a lamp with the broad side of the pinch;

Figure 2 shows a longitudinal section through the same lamp with the narrow side of the pinch;

Figure 3 shows a cross-section A—B through the flat pinch perpendicular to the lamp axis;

Figure 4 shows a stop and tail lamp with two filaments;

Figure 5 shows a longitudinal section through the lamp of Figure 4 with the narrow side of the pinch;

Figure 6 shows a cross-section C—D through the flat pinch of the base of Figure 4;

Figure 7 shows the side view of a lamp with the broad side of the pinch in which the principle of the bayonet base is realised;

Figure 8 shows the view of the same lamp from the other side;

Figure 9 shows the cross-section E—F through the pinch of the same lamp;

Figure 10 shows a further embodiment of an external pinch constructed in the form of a glass base;

Figure 11 represents the longitudinal section in plane I—J;

Figure 12 shows the cross-section in the plane G—H;

Figure 13 shows the cross-section through the external pinch of a third form of construction.

The lamp shown in Figures 1 to 3 has a tubular envelope 1 with an external pinch 2 which consists of a flat central portion bounded by two plane parallel faces 3, 4 and by two webs 5, 6, one at each end, which extend parallel to the lamp axis. The cross-section through the flat pinch in a plane A—B perpendicular to the lamp axis therefore has the I-shape shown in Figure 3.

The sides of the webs 5, 6 converge towards the central portion bounded by the faces 3, 4 and the faces of the webs forming the narrow sides 7, 8 of the pinch are parallel to one another. The current supply leads 9, 10 are sealed into the pinch and emerge from the end face 11 of the pinch in the form of loops 12, 13 which are bent round the central portion of the pinch and either bear against the face 3 or against the face 4 or extend parallel to these faces with slight spacing. The face ends of the supply leads are sealed in the pinch.

The webs 5, 6 have transverse elongate grooves 14, 15 on the faces 7, 8 forming the narrow sides of the pinch, which grooves pass right through and so produce notches 16 in the webs 5, 6 at the broad sides of the pinch.

The grooves 14, 15 are wedge-shaped and their depth is preferably somewhat greater than half, but less than the full, dimension a of the web 5 or 6 in the direction of the width of the flat pinch. The two grooves 14, 15 are generally at the same height. If non-interchangeability of the sides of the base is aimed at, as in two filament lamps for example, then the groove in the web 5 may be provided at a different height from that in web 6. The spacing of the grooves from the end face 11 of the pinch is greater than from the lower end of the bulb where this merges into the pinch. The grooves are above the plane extending perpendicular to the axis of the lamp and extend as far as the bent back current supply leads 12, 13 outside the lamp.

As a result of this construction, the holding members and contact zones are clearly separated. The designer of the holder is free in the selection of the planes at which the holding members should be, because both the notches 16 in the webs at the broad side of the pinch and the grooves 14, 15 at the narrow sides of the pinch can be used for the holding. The grooves 14, 15 offer a long spring travel and vibration-resistant holding so that the lamps can be used to particular advantage as auxiliary motor vehicle lamps (stop lamps, tail lamps, indicator lamps etc.). The insertion of the lamp in the holder is facilitated in particular by bevelling or rounding off at the

edges 17, 18 at the narrow sides of the pinch base, that is to say at the webs 5, 6 at the end face 11 of the pinch.

5 The assembly consisting of the two current supply leads 9, 10 and the filament 19 is held together by a glass bead 20 which is very flat in shape and is sealed at least partially into the pinch. An exhaust tube is likewise sealed into the pinch, for example a metal ex-
10 haust tube 21 which has the advantage, inter alia, that the thickness of the central portion of the pinch bounded by the faces 3, 4 and hence the accumulation of glass can be kept very low.

15 An increase in the useful luminous flux is obtained, particularly for motor vehicle lamps, by installing a reflector, for example of parabolic shape, in the lamp. The reflector axis coincides substantially with the axis of the lamp and the filament is disposed perpendicular to the axis of the reflector.

20 In a further form of construction (Figures 4 to 6), a top and tail lamp having two filaments is provided with the base according to the invention. The first filament 29 is carried
25 by the current supply leads 30 and 31 and the second filament 32 by the current supply leads 33 and 34. The ends of two current supply leads 31 and 33 each of which is associated with one of the two filaments are brought out
30 of the end face 35 of the flat pinch and bent back in the form of loops 37, 38 at the same side 36 of the flat pinch while the ends 39, 40 of the wire are taken back into the pinch and embedded therein. The other two current
35 supply leads 30 and 34 are likewise brought out of the end face of the pinch, bent round the other side 41 of the pinch and run towards one another at acute angles and are joined by their ends so that a looped contact 42 common to the filaments is formed.

40 In one form of construction, both ends of these current supply leads 30, 34 are joined by a weld 43 which lies partially in a trough-shaped recess 44 at the side 41 of the pinch.

45 In a two-filament incandescent lamp of this kind, it is important that the base should not be able to be inserted in the holder in the wrong direction. For this reason, the glass pinch bears one or more asymmetrical projections which prevent faulty insertion. For
50 example, the side 36 may have a projection 45, which may be hemispherical, between the looped contacts 37, 38 or it may extend in the form of a rib in the direction of the lamp axis in which case it preferably begins immediately
55 at the end face 35.

60 The lamp in Figures 7 to 9 has a tubular envelope 46 with an external pinch 47 which consists of a flat central portion bounded by two plane parallel faces 48, 49 and by two webs 50, 51, one at each end, which extend parallel to the lamp axis. The cross-section through the flat pinch in a plane E—F perpendicular to the lamp axis therefore has an

I-shape as shown in Figure 9. The sides of the webs 50, 51 converge towards the central portion bounded by the faces 48, 49 and the faces of the webs forming the narrow sides 52, 53 of the pinch are either plane and parallel to one another or are curved slightly cylindrically, for example part of the cylindrical surface round the lamp axis. The current supply leads 54, 55 are sealed into the pinch and emerge from the end face 56 of the pinch in the form of loops 57, 58 which are bent round the central portion of the pinch.

At the faces forming the narrow sides 52, 53 of the pinch, the webs 50, 51 have elongate grooves 59, 60 which start from one edge of the narrow side of the pinch in each case and extend obliquely with respect to the lamp axis towards the free end of the pinch leading away from the lamp, that is to say towards the end face 56, and end inside the web 50 or 51 before reaching the other edge of the narrow side of the pinch. In this case, seen from the left-hand edge of the narrow side, both notches extend downwards towards the right. The directions in which the notches extend therefore cross one another.

The ribs 61, 62 extending in the axial direction at the broad sides 48, 49 serve as aids to orientation. They co-operate with the guide edges of the holder which extend parallel to the ribs and which are elastically deformable in the direction perpendicular to the lamp axis. As soon as the lamp has been pressed so far into the holder that the rigid holding members referred to above can penetrate into the notches, these edges only offer a weak resistance to a turning movement.

The assembly consisting of the two current supply leads 54, 55 and filament 63 is held together by a glass bead 64 which is sealed at least partially into the pinch. Likewise sealed in the pinch and held by the bead is a metallic exhaust tube 65, which can however be replaced by a glass exhaust tube. Because of its greater thickness, the latter also provides the axially extending guide ribs 61, 62 in the pinch.

In the example, the boundary lines of the grooves 59, 60 form a parallelogram. It is also possible to select a shape which corresponds substantially to a trapezium, however.

Another embodiment of a glass base is illustrated in more detail in Figures 10, 11 and 12 and differs from the glass base in Figures 7 and 9 in that the loop-shaped ends of the current supply leads 70 and 71 at the broad sides 72 and 73 of the glass base run in grooves 74 and 75 which extend from the end face 76 of the pinch a short distance towards the bulb 66, and enter the pinch obliquely so that the depth of the grooves at the end face is equal to nil and is maximum at the ends of the grooves adjacent to the bulb. The loops 70 and 71 are bent through an angle which is greater than 90° so that they can run along the grooves 74 and 75. As a result, the portions

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of the loops running along the end face 76 and serving primarily as base contacts are particularly well secured. In order to enlarge these base contacts, the end face 76 is enlarged with respect to the spacing of two broad sides 72 and 73, at least at the point where the base contacts are bent round. As a result of these means, the chamfering and length of the grooves 74 and 75 can be increased.

In the example, the elongate grooves 77 and 78 are likewise arranged obliquely in the lateral webs of the pinch. Oblique grooves 74 and 75 and the widened end face 76, however, also form means according to the invention for those glass bases which do not have any inclined notches in the lateral webs because even in other forms of glass base it may be desired to increase the portions of the base contacts extending at the end face and to hold them better.

Another means of enlarging the contact areas at the end face of the pinch is illustrated in Figure 13. The glass material of the pinch forming the glass base 79 is unequally distributed with respect to the plane of symmetry K—L containing the sealed-in current supply leads 80, 81 so that it is greater between the sealed-in current supply lead 80 and the broad side 82 round which the associated loop 83 is bent while the spacing between the plane of symmetry K—L and the other broad side 84 is greatest at the site of the other current supply lead.

Because of its special characteristics, the new glass base is suitable not only for motor vehicle lamps and special-purpose and decorative lamps but also, instead of the usual screw-type base, for all-purpose incandescent lamps.

In the examples, a metal exhaust tube, preferably a copper exhaust, is provided in the pinch. In a single-filament lamp in particular, however, it is perfectly possible to seal a glass exhaust tube into the pinch instead of this. In other forms of construction, a glass exhaust tube is sealed on to the dome of the bulb.

WHAT WE CLAIM IS:—

1. An electric lamp comprising a glass bulb, a flattened glass pinch sealed to the glass bulb, lead wires brought through the pinch, looped and returned into the pinch, the looped portions of the lead wires being bent towards the pinch, and an elongate groove in each face of the two narrow sides of the pinch.

2. A lamp as claimed in Claim 1, wherein the pinch is constructed in the form of a lamp base and comprises a substantially flat central portion bounded by enlarged end portions.

3. A lamp as claimed in Claim 2, wherein the two faces of the enlarged end portions forming the narrow sides of the pinch are provided with transverse grooves which extend right across the narrow side faces so as to produce notches in the end portions at the broad side faces of the pinch.

4. A lamp as claimed in Claim 3, wherein the grooves are wedge-shaped with their sides

converging inwards and their depth is greater than half, but less than the full dimension of the enlarged end portions in the direction of the broad faces of the pinch.

5. A lamp as claimed in Claim 3 or 4, wherein both grooves are at the same distance from the end face of the pinch away from the bulb.

6. A lamp as claimed in claim 3 or 4, wherein the two grooves are provided at different distances from the end face of the pinch away from the bulb.

7. A lamp as claimed in any one of Claims 3 to 6, wherein the spacing of the grooves from the end face of the pinch away from the bulb is greater than from the end of the pinch where this merges into the bulb.

8. A lamp as claimed in any one of Claims 3 to 7, wherein the grooves are above a plane extending perpendicular to the lamp axis up to which the loops of current supply leads, extend outside the lamp.

9. A lamp as claimed in any one of Claims 2 to 8, wherein the edges of the narrow sides of the pinch are rounded off or bevelled where the enlarged end portions merge into the end face of the pinch away from the bulb.

10. A lamp as claimed in any one of claims 1 to 8, wherein two filaments are provided, one end of each pair of current supply leads associated with each of the two filaments are taken out of the pinch and bent round in the form of loops at the same broad side of the pinch while the other two leads are likewise taken out of the pinch but are bent round at the other side of the pinch and extend towards one another at an acute angle and are connected to one another by their ends and so as to form a third base contact common to both filaments.

11. A lamp as claimed in Claim 10 wherein one broad side of the pinch has a trough-shaped recess, and the ends of the current supply leads which form the common base contact are joined together by a welding point which lies partially in the recess.

12. A lamp as claimed in Claim 10 or 11, wherein the broad side of the pinch carrying the two loop-shaped contacts has a projection substantially in the form of a hemisphere or of a rib extending longitudinally in the direction of the lamp axis and beginning immediately at the end face of the pinch, this projection lying between the two loop shaped contacts.

13. A lamp as claimed in any one of Claims 2 to 12, wherein the grooves extend obliquely with respect to the lamp axis.

14. A lamp as claimed in Claim 13, wherein the grooves each extend from one side edge of one narrow side of the pinch obliquely towards the end of the pinch away from the bulb and end inside the enlarged end portion before the other side edge of the narrow side of the pinch, and wherein both grooves start from different narrow sides and according to

- the direction in which they extend are crossed.
15. A lamp as claimed in Claim 13 or 14, wherein the broad sides of the pinch are provided with guide webs, extending longitudinally of the lamp axis. 5
16. A lamp as claimed in any one of claims 2 to 15, wherein a further groove extending from the end face of the pinch towards the bulb and receiving the base contacts is provided at each of the broad sides of the pinch 10 the grooves extending from the end face obliquely into the pinch so that these grooves have their shallowest depth at the end face and their greatest depth at their end adjacent to the bulb. 15
17. An incandescent lamp as claimed in any one of Claims 2 to 15, wherein the glass material of the pinch is unequally distributed with regard to the plane of symmetry containing the sealed-in current supply leads so that it is greatest in the region of the particular current supply lead at the side round which this current supply lead is bent as a base contact. 20
18. A lamp as claimed in Claim 16 or 17, wherein the width of the end face of the pinch away from the bulb is enlarged in comparison with the spacing of the two broad sides. 25
19. An electric lamp substantially as herein described with reference to Figure 1 to 3, 4 to 6, 7 to 9, 10 to 12, or 13 of the accompanying drawings. 30
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COMPLETE SPECIFICATION

4 SHEETS

*This drawing is a reproduction of
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Sheet 1*

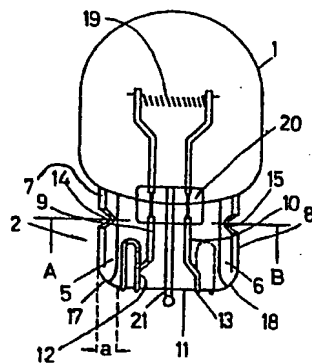


FIG. 1

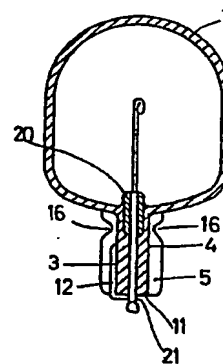


FIG. 2

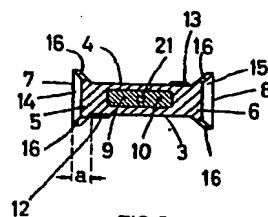


FIG. 3

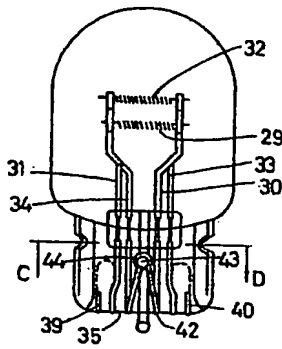


FIG. 4

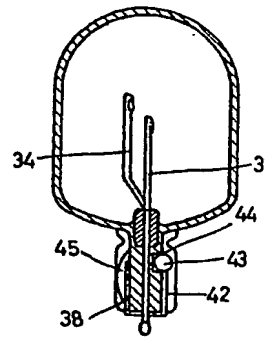


FIG. 5

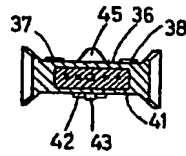


FIG. 6

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COMPLETE SPECIFICATION

4 SHEETS

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Sheet 3

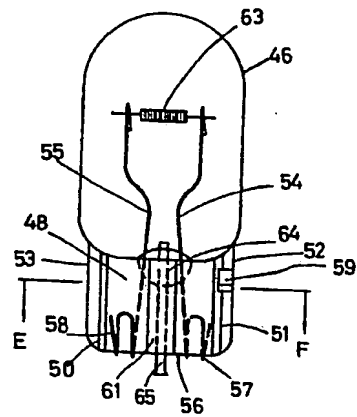


FIG. 7

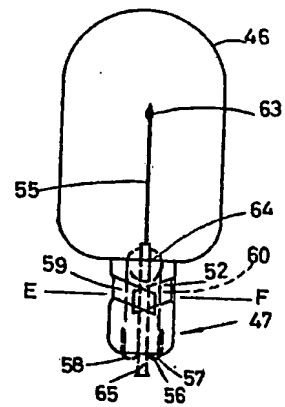


FIG. 8

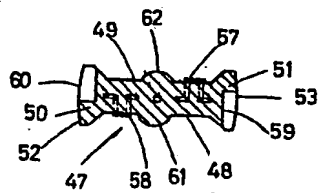


FIG. 9

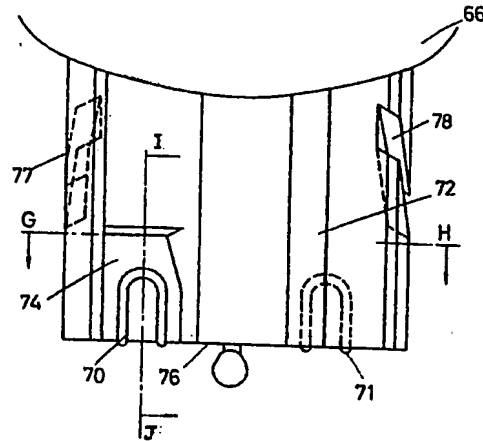


FIG. 10

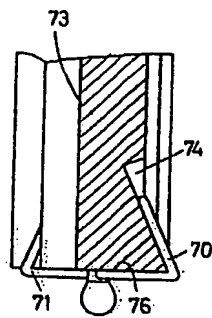


FIG. 11

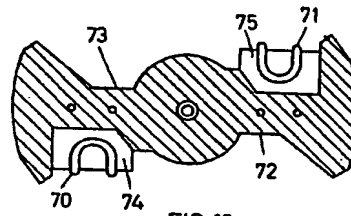


FIG. 12

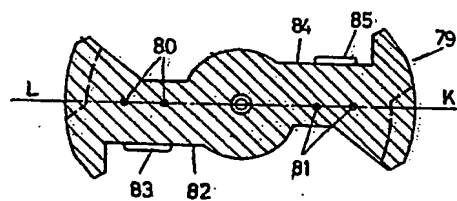


FIG. 13